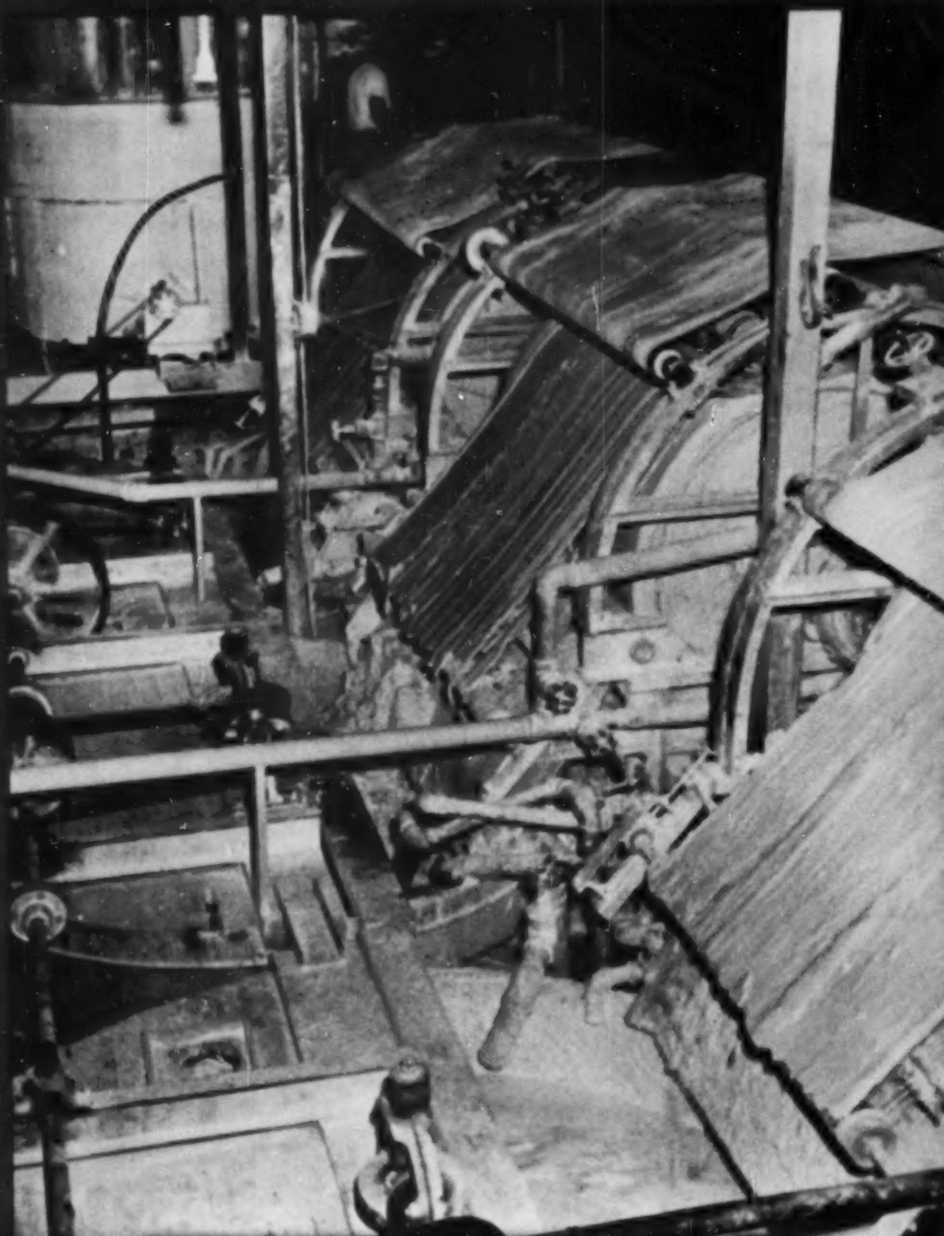
The INSTITUTE Spokesman

AUGUST [illegible]



OFFICIAL PUBLICATION

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The "MILLION-STROKE" Industrial Grease!

A grease that will stand 100,000 punishing strokes of the ASTM Work Tester has been considered a superior lubricant.

In a deliberate attempt to break down Shell Alvania Grease, *on the same tester* the run was extended . . . 200,000 strokes . . . 300,000 strokes . . . 500,000 strokes! Finally, at one million strokes the test was discontinued, because this grease *would not break down*—it was still a fit lubricant both in appearance and consistency.

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IMPROVE QUALITY	When you make a stearate from HYDROFOL ACIDS, you can be certain that it is free from all highly unsaturated acids, metals, or metal soaps. HYDROFOL stearates are free from all oxygen absorbing materials.

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The **INSTITUTE SPOKESMAN**

Published monthly by

THE NATIONAL LUBRICATING GREASE INSTITUTE
4638 J. C. Nichols Parkway, Kansas City 2, Mo.

HARRY F. BENNETTS, *Editor*

1 Year Subscription $2.00 1 Year Subscription (Foreign) $2.75

In This Issue AUGUST, 1950

Volume XIV Number 5

ABOUT THE COVER

Impurities that are permitted to remain in a metallic soap after completion of its manufacture reduce its active ingredients and frequently impair its working properties. This is true in the production of stearates just as it is in the case of many other chemicals. In making metallic soaps by the precipitation process the chief impurities are soluble salts.

The Metasap Chemical Company goes to unlimited lengths to produce commercially pure products that will meet the demands of its customers and the challenge of its competition. The removal of undesirable soluble salts from its metallic soap products is accomplished by means of a battery of string discharge rotary filters. The photograph on the cover shows the arrangement of three such filters employed at the company's Cedartown, Georgia plant for the washing operation.

The soluble salts and other impurities are removed progressively in a series of filtering operations, as the stearate passes from one rotary filter to the next. From the final filter, the stearate "cake", now washed almost wholly free from impurities, goes into the driers and then to the pulverizers or grinders. From here it emerges as the soft fluffy powder so applicable to dozens of American industries. Foremost among these industries is, of course, greasemaking where the contribution of such metallic soaps as aluminum stearate to the production of high quality, crystal clear, waterproof greases has long been recognized.

President's page

by Arthur J. Daniel, President, N.L.G.I.

CANDY AND CAKE

Business historians may some day refer to our present times as "The Age of Diversified Selling". To illustrate my point, you can walk into a modern drug store and find very little resemblance to the original apothecary store. The corner grocery has become a "super market", and the "gasoline" station has become a "one-stop" merchandise unit where a motorist may often purchase everything for his automobile in the way of parts and accessories, as well as chewing gum, bicycles, electric appliances, etc.

VARIETY STORE MERCHANDISE

You have often heard the statement that "history repeats itself", and I can see proof of this statement in the Petroleum Industry. I can well remember the first gasoline pumps that were set up in front of the local variety store. One of the main reasons that the variety store owner installed the pump was not only to sell the gasoline and oil, but to entice the motorist into his store and sell him other merchandise. As time passed, the sales of gasoline, oil, and grease lubrication became the primary objective of the service station. However, today we are reversing this trend and, once again, variety store merchandising has come into its own at many service stations through the sales of all types of items under the broad classification of TBA.

Certainly, we can find no fault with this aggressive merchandising spirit, it is one of the things that has made our Industry great. However, we must remember that the primary reason for a motorist driving into the service station is to secure petroleum products and services. The service station that fails to provide this fundamental requirement will find its business life endangered.

LUBRICATION — THE PRIMARY INTEREST

A recent survey which attracted wide attention within our Industry revealed that the number of car owners going to service stations for grease lubrication had fallen from 71% to only 51% in two years time. Although a large part of this change in the national lubrication habit may, no doubt, be attributed to the extensive advertising of automotive dealers and manufacturers, it verifies the fact that car owners are sincerely interested in the quality of lubrication which their automobiles receive.

LUBRICATION AIDS TBA SALES

The American motorist is "always in a hurry". Competition has brought about the development of high-speed gasoline pumps to replace the slower-gravity-operated pumps . . . driveway oil changers permit oil changes within three minutes time . . . and as a result, the average motorist spends less time per stop at the service station than ever before. But, the service station operator that offers a superior grease lubrication service gains time to place the automobile on a hoist and can use this extra time to push the sale of his accessories and sundry items.

Grease lubrication also offers the station operator the golden opportunity of finding just what it is that the automobile needs in the way of parts, replacements, or accessories. By knowing the needs of the motorist, the station operator can more easily find a receptive ear for his TBA sales talk.

With the development of the service station TBA programs, grease lubrication became an even more necessary part of the overall station sales program. For, failure to provide an efficient lubrication service will mean the loss of customers to other stations, automotive dealer, and repair shops with the resulting loss in TBA sales. Expanded TBA lines can increase the service station profit if the station operators will furnish the bread and butter items that will bring customers into their station before they concentrate on selling the candy and cake of TBA.

SPECIFIC FATTY ACIDS AND GLYCERIDES FOR Lubricating Greases

IN 1815 a famous French chemist, Chevreul, brought forth the first accurate scientific theory of the saponification process. Tallow was saponified with lime or caustic and the soap split with sulfuric acid. The strange phenomenal substance separated was acidic, and became known as fatty acids. The acids burned in candles with less smoke than regular tallow, and did not irritate the eyes. This was the birth of the fatty acid industry and a boon to the candle manufacturers.

About a year later, Bracannot, another French chemist, discovered that fats or fatty acids were mechanical mixtures of solid and liquid portions, and could easily be separated by pressing. The pressing of fatty acids and glycerides was soon developed primarily for the purpose of making hard candles. The cake, or solid portion, was called stearine, and when pressing fatty acids the stearine became known as stearic acid.

George Gwynne patented distillation of fatty acids in vacuo in 1840. The equipment was too cumbersome, so vacuum distillation was given up and supplanted in 1843 by straight steam distillation at atmospheric presure. Distillation partially deodorized and lightened the color of the fatty acids. Distilled acids not only simplified pressing operations, but improved the quality of the pressed stearic acid.

In 1853, R. A. Tilghman discovered that fatty acids and glycerine could be separated from the glyceride by water at elevated temperatures and pressures. Pressure hydrolysis or autoclaving of fats was born. Shortly thereafter fatty acids were introduced in the grease industry.

Ernst Twitchell in 1897 patented the process of decomposing glycerides into fatty acids and glycerine by boiling with water over a certain period of time, using a reagent of sulfofatty acids.

Hydrogenation of fats using nickel catalyst was first introduced in 1899 by Prof. Sabatier, another French chemist from Toulouse.

During the next quarter of a century the development of fatty acids progressed at a slow pace. Grease makers had to be content with the limited fatty acids or glycerides that were available. In the case of animal oils or fatty acids, the uniformity depended on the animals whims, temperament and moods—whether lazy or energetic—as well as the climate—rainy or dry—hot or cold—terrain, grass they fed on, et cetera. Nature has a way to protect the species put on this earth. If the weather is too hot, the fats of the animal are harder and more saturated, having a lower iodine value, whereas in colder regions, the fats are generally more unsaturated or lower melting.

Similarly the same non-uniformity applies to vegetable and marine oils. The chain length as well as the unsaturation will vary.

Fatty acids, distilled or processed by other means, obviously will have a similar composition as the glycerides from which they were derived. Distillation did remove some oxidized, polymerized and high boiling constituents, but by and large, the grease makers had very little uniformity to work with. Pressed acids, or acids derived from hydrogenated fats were more uniform because at least the degree of unsaturation or the iodine value could be controlled.

Since 1925 the progress of fatty acids and derivatives has been stepped up to a revolutionary tempo.

The recent scientific developments in the fatty acid industry are numerous and renowned. In the field of distillation, continuous stainless steel stills and fractionating columns have been perfected to produce commercially new fatty acids of superior quality and uniformity. Pure acids ranging from caprylic to behenic are acquired if proper natural oils are used, such as vegetable, marine or animal. The production of synthetic fatty acids by oxidation of paraffin makes available both odd and branch chain acids. The pure saturated acids are fractionated from hydrogenated crude stocks, but natural occuring acids can also be separated into their proper chain length and further separated into saturated and unsaturated acids by pressing or solvent crystallization.

Except for certain specialty greases, pure acids are, no doubt, too expensive or may be even undesirable. By partial fractionation, desirable acids can be concentrated and objectionable elements, such as aldehydes or other unsaponifiable matter, greatly reduced or entirely eliminated. Natural oils, such as tallow in particular, have a tendency of reverting and become rancid very rapidly, especially during warm weather, and in the presence of moisture. The result is high free fatty acid content, dark color, high oxyacids,

"Both grease and fat industries have made great strides in recent years, so proper continued cooperative research between the grease and fat manufacturers should bring out developments advantageous to both."

by **O. GRAZIANI, F. C. HAAS, J. D. HETCHLER**

The Werner G. Smith Company, Wyandotte, Michigan

et cetera. Oxyacids are exactly what the word implies—oxidized fatty acids. They may be oxidized to the stage of polymerization that has a tendency to gum up very rapidly, or to the decomposition point producing low molecular weight hydrocarbons, fatty acids and some dicarboxylic acids. All these products are bound to change the characteristics of the grease. During distillation, oxyacids as well as color bodies, polymerized or gummed up impurities and some unsaponifiable matter will remain in the still residue. Since greases are made with metalic soaps of fatty acids, the elimination of unsaponifiable matter and other impurities tending to gum up should produce a superior and more uniform grease.

Fatty acids will react to form metallic soaps faster and easier than glycerides and yield about 6% more soap content. The distilled acids can also be partially fractionated to insure uniformity. When making special greases, the saving in time, increased soap yield, better quality and more uniform grease should overcome the added expense of fatty acids.

Due to the varieties and specialties in greases, grease makers should carefully choose the proper type of fatty acids or glycerides. There are objections to stocking too many types of fats or fatty acids, but it is a definite fact that one particular acid or mixture of acids will not serve all around purposes. High molecular weight fatty acids will give a low pour point and better congealing than low molecular weight acids. Metallic soaps made from fatty acids of varying characteristics such as myristic, behenic, or hydroxystearic acids will certainly produce greases with different characteristics.

Pure fatty acids have higher melting points, are more crystalline, and powder up more easily than mixtures of fatty acids. The resulting soaps will have similar characteristics. The proper mixture described can be carefully controlled by partial fractionation.

Glycerine has a tendency to oxidize at elevated temperatures and the resulting oxidation products are acids which attack iron, forming excellent oxidation accelerators. Glycerine is also highly hygroscopic, and if enough water is absorbed it will help break up the grease.

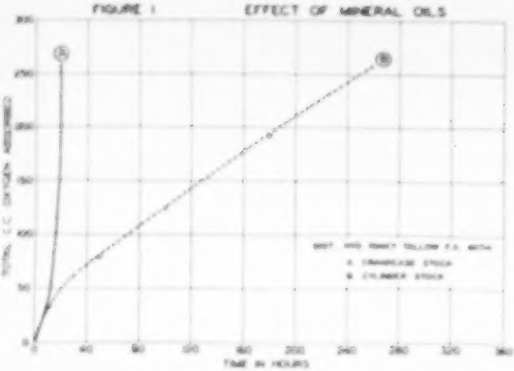
A good grease should have a minimum of internal cohesion and enough body to prevent separation under pressure. Soda soap, oil and glycerine are more or less mechanical mixtures, and the oil may be pressed out of the soap. Aliphatic alchols such as cetyl or stearyl are soluble in both soda soaps and mineral oils, and should act as plasticizers to produce smoother and more firmly bound greases. Spermaceti has been used as a modifier for smooth soda base grease, no doubt for its cetyl aclohol content. Sperm oil is used in certain greases to increase oiliness and reduce coefficient of friction when in use, again indicating desirable effects of aliphatic alcohols or their esters.

Amongst the many requirements of a good grease is freedom from components which have a tendency to absorb oxygen and become gummy. Highly unsaturated acids absorb oxygen very rapidly in proportion to the degree of unsaturation. The monounsaturated acids such as oleic acid are fairly stable, if a catalytic accelerator is not present, so all polyunsaturated acids should be eliminated in greases unless such acids are essential to bring out the desired characteristics in the grease made.

The art of hydrogenating fatty acids, glycerides, and esters has made rapid progres, particularly in specialized fields. Hydrogen can be added to the unsaturated bonds with pressure, temperature, and an active catalyst such as nickel. The polyunsaturated acids will absorb hydrogen more readily than the monounsaturated acids. If the conditions are carefully controlled and a highly selective catalyst is used, linolenic acid with three double bonds can be reduced to linoleic acid with two double bonds, which in turn is reduced to oleic acid with only one double bond before any appreciable amount of oleic acid is reduced to stearic acid, which is saturated. Fats or fatty acids can be selectively hydrogenerated and thus actually increase the oleic acid content.

When castor oil is hydrogenated there is a good chance of removing the hydroxyl radical, converting ricinoleic acid to linoleic acid or its isomer, which in turn is reduced to stearic acid instead of hydroxystearic acid. Careful selectivity and proper conditions will convert all the ricinoleic acid to hydroxystearic acid. Lithium soaps and cetyl or stearyl alcohol esters of hydroxystearic acid as produced from castor oil are important to the grease trade.

The production of aliphatic alcohols by either high pressure hydrogeneration of esters using copper chromite catalyst



"check made on type of mineral oil to be used."

or metallic sodium reduction in the presence of suitable solvents has been perfected. Thus saturated and unsaturated alcohols of similar composition as the fatty oils are made available. The mixtures can be further fractionated into chain lengths from eight to twenty-two carbons.

Alcohols are used in greases and the lubricating industry in the form of metallic alcoholates, mercaptans, esters of hydroxyacids or dicarboxylic acids, and other derivatives.

There have been many other important developments in the fat and oil industry. Liquid-liquid extraction of fatty acids or glycerides improves color stability, and effects some fractionation due to differences in solubility. The separation of saturated and unsaturated fatty acids is made highly efficient by modern solvent crystallization. Reorientation of the fatty acids in the glyceride molecule achieves a more complete desaturation of glycerides without converting to fatty acids. High molecular weight dicarboxylic acids are manufactured by the oxidation of mono-unsaturated acids such as oleic or erucic acids. Sebacic acid is made by reacting caustic with castor oil at proper temperature and pressure. Techniques in chlorination, sulfurization, continuous splitting, refining, deodorizing, and esterification have been improved. These scientifically developed processes are used to produce superior and more uniform special or synthetic derivatives for greases or lubricants.

There are many diversified ideas and concepts as to the proper fatty acids or glycerides for special greases. Intensive research has been, and is, conducted in the field of greases to determine the proper mineral oil, metals used for saponification, methods of saponification, additives and other derivatives, methods of testing, et cetera. When it comes to the thorough investigation of specific fats or fatty acids for special greases, the grease makers are quite often faced with the problem of conducting what is commonly known as intensive suppliers research. The result is a more weakened effort due to the fear that there is a good chance the next shipment of the fat will have an entirely different composition which may change the picture entirely.

At times the matter is further complicated because the fat industry sells to the metallic stearate manufacturers who in turn sell to the grease makers. Metallic stearates are still stearates whether they are made from pressed stearic acids, hydrogenated oils, or hydrogenated fatty acids from fish, animal, cottonseed, or soya. The iodine value can be fairly constant, but the composition or chain length of the fatty acids can differ tremendously. The content of stearic acid can vary, for example, from about 25% in hydrogenated fish oil to 90% in hydrogenated soya or fractionated stearic acid. Unless the complete information and exact composition of the stearates are known, it must be very difficult to make uniform greases. More intelligent specifications can be set up for the procurement of fats and fatty acids. Ordinary analytical specifications are not desirable. There are many ways titre and iodine specifications can be met that would result in eutectics and reflect in the finished product. Cheaper, or bargain, fats and fatty acids should be looked upon with suspicion.

Both grease and fat industries have made great strides in recent years, so proper continued cooperative research between the grease and fat manufacturers should bring out developments advantageous to both.

Many ideas have been exhausted in trying to stabilize fatty acids or glycerides against color reversion, rancidity, or ability to absorb oxygen. It is a known fact that fatty acids lend themselves to more diversified scientific treatments than the glycerides. As a general rule, the highly unstable portion of fats are either low boiling compounds such as aldehydes, other unsaponifiable matter, and decomposition products or high boiling and readily polymerizable compounds such as oxyacids and metallic accelerators. These can be removed by simple distillation, or partial fractionation, without much difficulty. Since fatty acids are freed from the glycerine molecule, the actions of strong mineral acids, activated absorbents, and solvents are more selective. Fatty acids that are more uniform and are more stable to oxidation can thus be produced.

Experiments were run to show the effect of raw materials and processing techniques on the oxidation stability of fatty acids. A journal compound type of grease was used for oxidation tests on account of the high soda soap content. The greases were checked in a standard Norma-Hoffman accelerated oxidation apparatus starting at 110 pounds oxygen pressure, and at a constant temperature of 260°F.

The greases were made as follows: exactly 830 grams of mineral oil (200 SSU at 210°F.) were weighed, a 500 ml. dropping funnel was filled, and the rest added to a small stainless steel steam-jacketed kettle 8" ID x 12" high provided with an anchor type agitator rotating at 58 r.p.m. Exactly 568.5 grams of fatty acids were added to the mineral oil, then 150 p.s.i. steam turned on long enough to melt the acids. With agitation the calculated amount (plus 0.1 to 0.2% excess) of 50° Baume caustic solution to neutralize the fatty acids was added slowly. Steam was turned on full and dehydration was affected in three hours at 150-155°C. The rest of the oil in the dropping funnel was added dropwise at the rate of 120 drops per minute. Mixing was continued two hours after all the oil had been added. The finished grease was removed from the kettle and allowed to cool to room temperature in a wooden box 12 x 20 x 6 cm. Exactly 20 grams of the grease were sliced into five equal parts and placed on small Pyrex glass dishes which were inserted with a rack into a Norma Hoffman oxygen bomb. The bomb was purged five times with oxygen at 110 pounds pressure, checked for leaks at room temperature, and then placed in the constant temperature bath at 260°F. The initial pressure was 110 p.s.i., and pressure readings were taken every two to four hours.

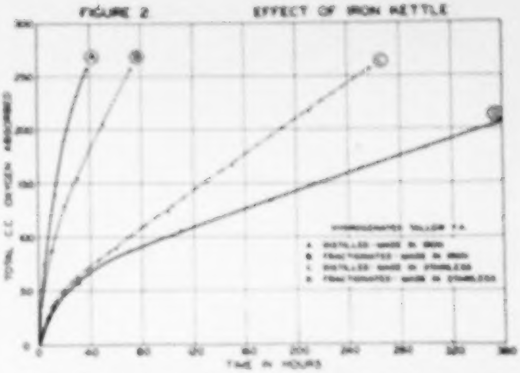
The first check was made on the type of mineral oil to be used (Figure 1). Greases were made with a good grade of distilled hydrogenated animal acids using a cylinder stock oil (200 SSU at 210°F.) and a crankcase stock oil (100 SSU at 210°F.). The mineral oils contained no antioxidants or other additives that could interfere with future tests. The grease made with the crankcase stock oil absorbed oxygen very rapidly, so all other tests were run with the cylinder stock oil.

The proper choice of metal when designing grease kettles is important as noted in Figure 2. Stainless steel and iron grease kettles were available, so similar greases were made in both in order to determine if the metal of the grease kettle affected the finished grease. The accelerated action of the kettle alone is quite noticeable. Curves A and C represent greases with the same distilled hydrogenated animal acids made in iron and stainless steel kettles respectively. Curves B and D are greases made from the same acids which were partially fractionated to concentrate the palmitic acid content or lower molecular weight acids. Besides giving the accelerated action of the iron, the curves of Figure 2 also indicate that lower molecular weight acids are more stable to the accelerated oxidation test.

Glycerides most generally contain natural antioxidants, but the curves in Figure 3 surprisingly show that greases made from the distilled fatty acids are much more stable. It was also noted that the greases made with hydrogenated oils were much more fibrous and not as oily as the greases made with the hydrogenated fatty acids. Refining hydrogenated animal glycerides did not remove the natural preservatives or antioxidants because curve C is better than curve A made with crude tallow. To determine whether the increased oxygen absorption was mainly due to the glycerine liberated as a result of saponification, a grease was made with good hard animal fatty acids plus the addition of 10% C.P. glycerine. Figure 4 clearly shows that free glycerine absorbs oxygen more rapidly than the sodium soaps.

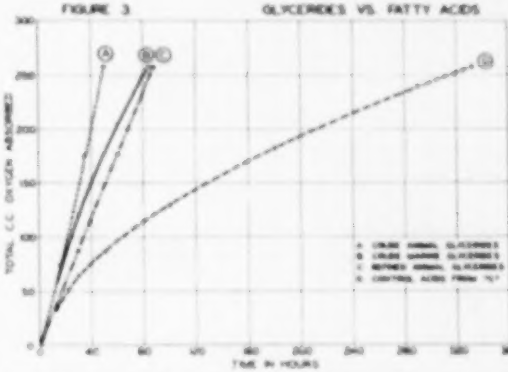
The choice of raw material is very important in order to produce a grease stabilized against oxidation. Figure 5 shows oxygen absorption curves for greases made with hydrogenated acids from marine oil soapstock, marine oil, low boiling and high boiling fractions of marine oil. The acids from soapstocks are not as stable as the acids from the regular

FIGURE 2 EFFECT OF IRON KETTLE



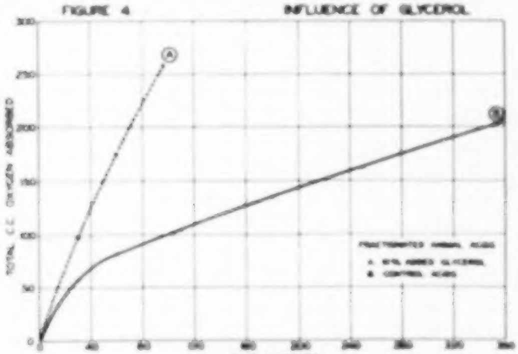
"The proper choice of metal when designing grease kettles is important . . ."

FIGURE 3 GLYCERIDES VS. FATTY ACIDS



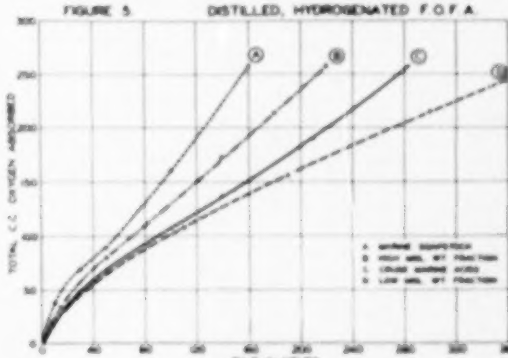
"greases made from the distilled fatty acids are much more stable."

FIGURE 4 INFLUENCE OF GLYCEROL



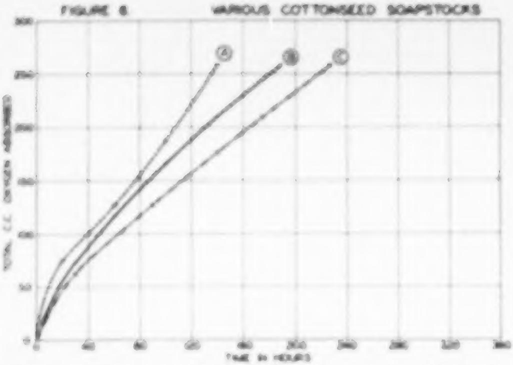
". . . free glycerine absorbs oxygen more rapidly than the sodium soaps."

FIGURE 5 DISTILLED, HYDROGENATED F.O.F.A.



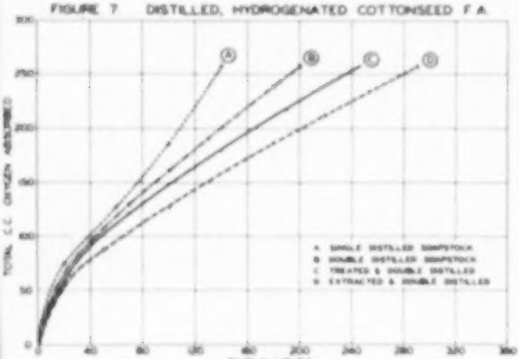
"The choice of raw material is very important in order to produce a grease stabilized against oxidation."

FIGURE 6 VARIOUS COTTONSEED SOAPSTOCKS



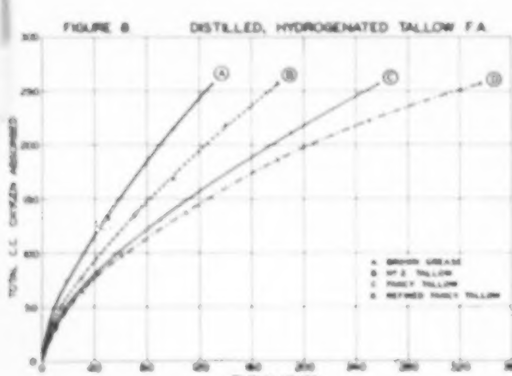
"The variation in acidulated soapstocks, especially cottonseed, is not only due to the section of the country the cotton is grown, but also the method used to refine the oil."

FIGURE 7 DISTILLED, HYDROGENATED COTTONSEED F.A.



"The original oil can vary in stability or uniformity, but with proper hydrogenation, fractionation . . . uniform stable fatty acids can be produced."

FIGURE 8 DISTILLED, HYDROGENATED TALLOW F.A.



. . . "Different tallow stocks . . . vary the stability of greases . . ."

marine oil. Also note the effect of partially fractionated acids in marine oils. The low molecular weight acids are much more stable than the high molecular weight acids.

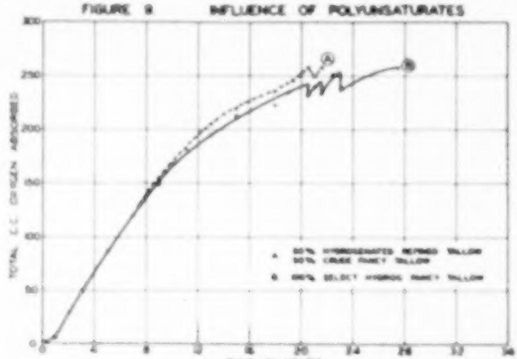
The variation in acidulated soapstocks, especially cottonseed, is not only due to the section of the country the cotton is grown, but also the method used to refine the oil. Old batch methods which gave high losses will produce a much better soapstock than modern continuous refining processes which strip out the last ounce of good oil. Such a soapstock is therefore richer in oxy compounds, unsaponifiable matter, dirt, et cetera. The corresponding acids are also of inferior quality unless they are processed in a special manner. Three different tank cars of acidulated cottonseed soapstock of unknown origin were processed in identical manner, and the resulting greases checked for oxygen absorption (Figure 6).

The worst grade of cottonseed soapstock (curve A, Figure 6) was subjected to modern scientifically improved processing technique, and the result was fatty acids equivalent to or better than those produced from good oils (Figure 7). The original crude can vary in stability or uniformity, but with proper hydrogenation, fractionation, and other refinements, uniform stable fatty acids can be produced. It is not possible to make such improvements on glycerides without converting to fatty acids and then resynthesizing. Curve A shows single distilled hydrogenated cottonseed fatty acids. Curve B represents the same acids which were merely redistilled and about 3% of the low boiling material separated. The acids for curve C were subjected to a strong acid wash before double distilling. Solvent extraction and double distillation was applied to the fatty acids for curve D.

Different tallow stocks will also vary the stability of greases as shown in Figure 8. You will note that refined fancy tallow yields fatty acids far superior to Number 2 tallow if processed in the same manner.

Polyunsaturated acids or soaps made from the acids have a tendency to absorb oxygen very rapidly. Soda base greases containing only 14% soda soap were made with crude tallow glycerides and selectively hydrogenated tallow glycerides. The selectively hydrogenated tallow was checked free of polyunsaturates by means of a Beckman Spectrophotometer. The crude tallow contained 3.7% of linoleic acid, since it was mixed with an equal portion of completely hydrogenated tallow, the total fat mixture contained 1.8% polyunsaturates.

FIGURE 9 INFLUENCE OF POLYUNSATURATES



. . . "Polyunsaturated acids . . . have a tendency to absorb oxygen very rapidly."

The difference was not too great, but noticeable since the concentration of soda soap was only 14% and the free glycerine also accelerates absorption. Note the jagged curve near the end of the test (Figure 9). It appears that peroxides produced during the oxidation suddenly decomposed, releasing free oxygen or other gases, because the pressure would suddenly jump 3 to 6 pounds and then drop more rapidly than the average rate of oxygen absorption. Figure 10 shows the same effect of polyunsaturates on a journal compound type grease. Note that the absorption now shows a marked difference. Marine oil was hydrogenated very carefully to a twenty iodine value, and checked with the spectrophotometer to be free of polyunsaturates. Another sample from the same oil was rapidly hydrogenated at higher pressures and the linoleic acid content was determined to be 1.6%. Fatty acids were made and the respective greases checked.

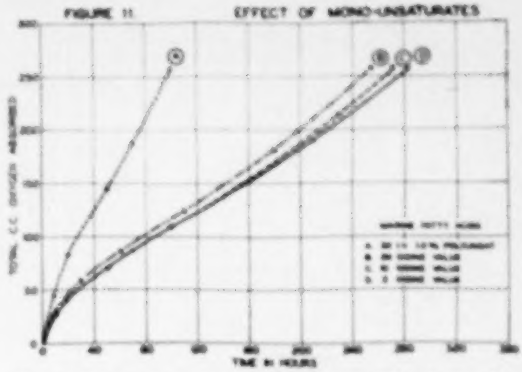
The effect of varying amounts of oleic or mono-unsaturated acids is shown in Figure 11. Refined marine oil was hydrogenated very selectively until free of polyunsaturates to a 20 iodine value, and samples taken periodically until the oil was completely saturated. The samples were split, distilled and used for greases. There was some noticeable difference in oxygen absorption, but not as great as the difference caused by the presence of a small amount of polyunsaturated acid. Curve A represents a sample taken at 30 iodine value, but it still contained 1.0% polyunsaturated acids.

The age of commercial fatty acids is also very important if a stable grease is desired. Figure 12 shows greases made from two good grade commercial fatty acids. The acids were kept in cloth bags for six months and the same test duplicated. Note the decrease in stability. The double-pressed stearic acid deteriorated to a greater extent because it was in a powdered form whereas the hardened fish acids were flaked and therefore had less surface subjected to atmospheric oxidation while standing.

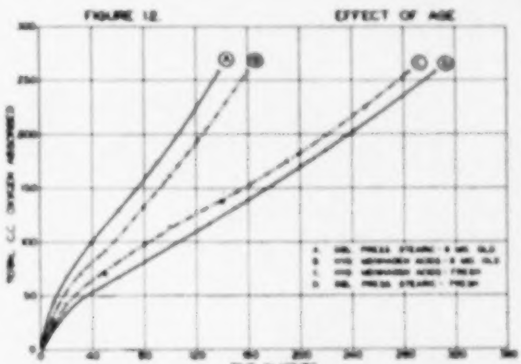
Typical curves for commercial fatty acids are drawn in Figure 13. The tests were run at 235°F.

CONCLUSIONS:

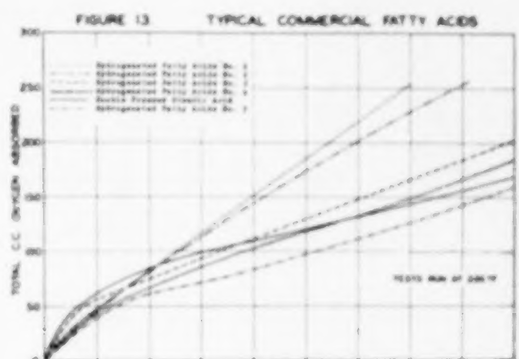
Oxygen absorption is stepped up by the presence of iron, glycerine and polyunsaturates. Mono-unsaturated acids are very stable. Lower molecular weight acids are more stable than those of higher molecular weight. Proper raw stocks and careful processing are very important for the production of a good stable grease.



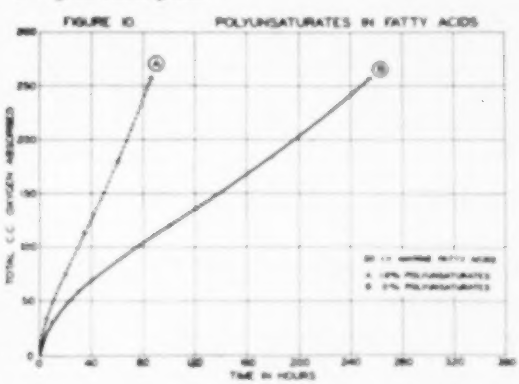
"Curve A represents a sample taken at 30 iodine value . . . contained 1.0% polyunsaturated acids."



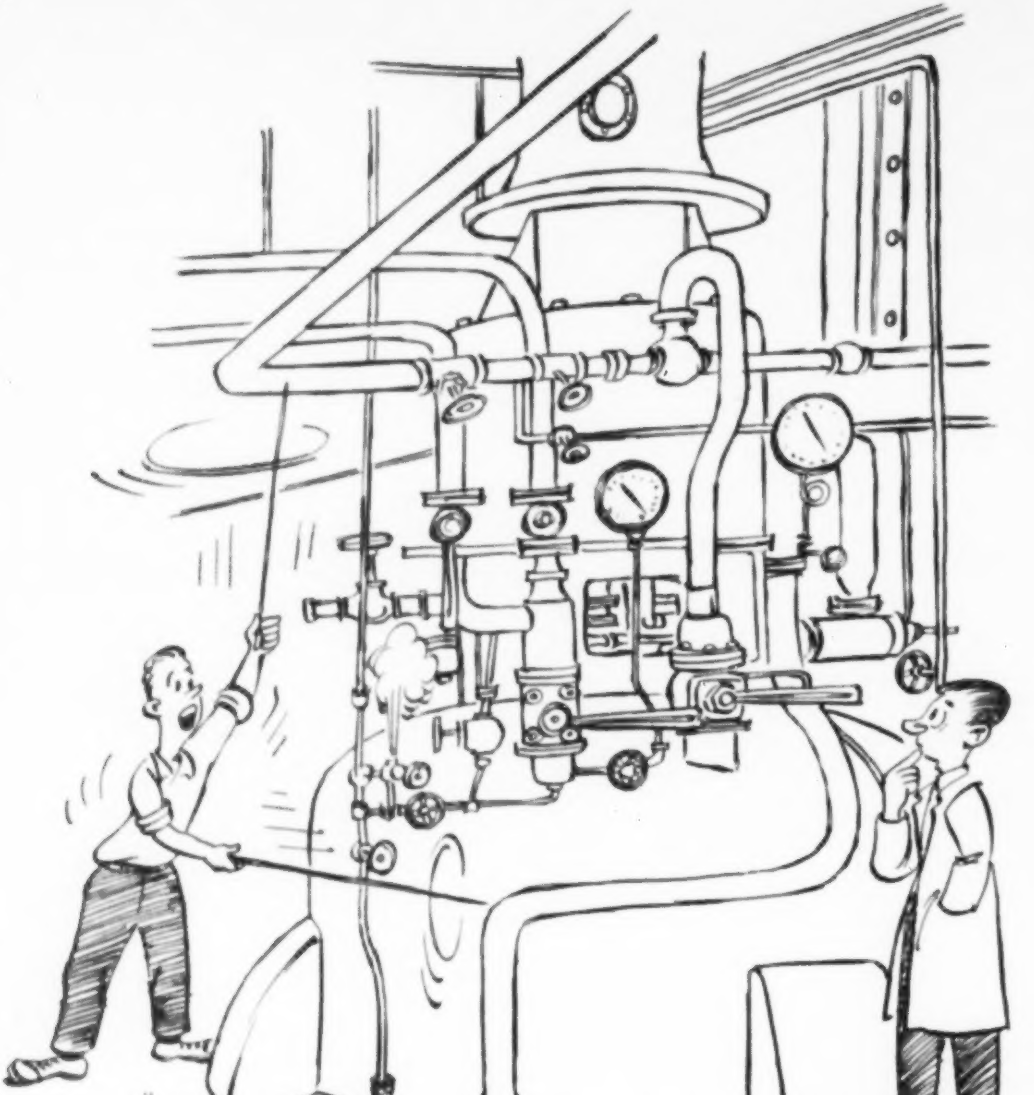
"The age of commercial fatty acids is also very important if a stable grease is desired."



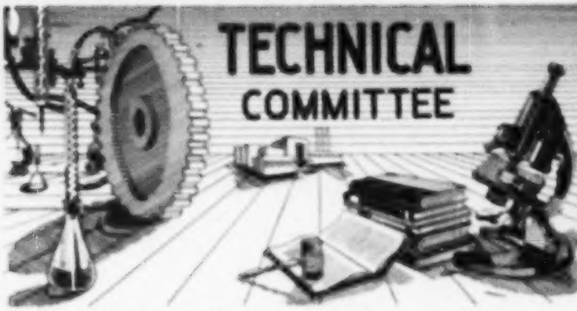
Above . . . "Tpyical curves for commercial fatty acidc . . . tests were run at 235°F."



Left . . . "effect of polyunsaturates on a journal compound type grease."



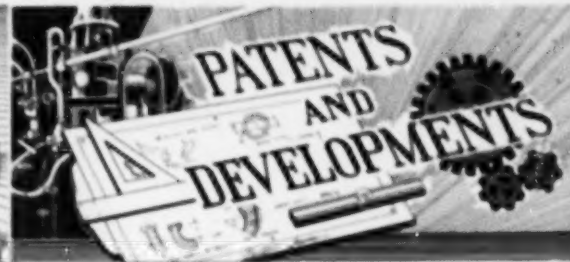
"If you're going by car to the N. L. G. I. Annual Meeting in Chicago—why don't you take highway What's-Its-Name here in Whatchamacallit, stay on it into I-Forget-Its-Name and then right on down here to the Loop - - - follow me?"



Chairman T. G. Roehner, Director of the Technical Service Department, Socony-Vacuum Laboratories

The ABEC-NLGI Cooperative Committee on Grease Test Methods initiated another project at its Annual Meeting on June 9. It was the consensus of the meeting that the misuse of high pressure greasing equipment is causing considerable damage to certain bearings by blowing out seals. A Subcommittee will be organized with Mr. J. M. Bryant of Link-Belt Company as Chairman. They will assemble available information on this subject and prepare an ABEC-NLGI Technical Bulletin for general distribution. Any member who has some information to contribute to this project is urged to write to Mr. J. M. Bryant, Link-Belt Company, 519 N. Holmes Avenue, Indianapolis 6, Indiana, or to the undersigned.

In last month's Column, reference was made to the change in design of the BEC Tester. This project is being handled by a Subcommittee with Mr. Carl T. Hewitt of Fafnir Bearing Company as Chairman. Copies of AFBMA Guide for the Selection of Lubricants for Ball and Roller Bearings and of the revised BEC Tester referred to therein may be obtained by writing direct to the Anti-Friction Bearing Manufacturers Association, Inc., 60 East 42nd Street, New York 17, N. Y., or to Mr. Harry Bennetts or the undersigned, who will arrange for copies to be relayed to you. At the time of the June 9 meeting, six bids were on hand for the manufacture of the tester. The quotations are influenced to an important extent by the number of units ordered. Therefore, any member who is interested in obtaining a machine, should write promptly to Mr. C. T. Hewitt, Fafnir Bearing Company, New Britain, Connecticut. As soon as the machines are available, samples of carefully selected ball bearing greases will be distributed for a survey to check the reproducibility and repeatability of the method of test utilizing that equipment. The information from that survey will also be used as the basis for the preparation of an ABEC-NLGI Technical Bulletin covering that method and particularly interpretation of the data obtained therewith.



LOW TEMPERATURE AIRCRAFT GREASE—Texas Co. reports that its Texaco Uni-Temp grease, first marketed to meet A-N requirements for low temperature aircraft lubricating grease has been improved and now also meets requirements for U.S. Army instrument lubricating users (Oil & Gas J. 6/22 p. 342).

STABLE REVERSIBLE GREASES—Shell Development Co. obtained a reissue of its U.S. patent 2,475,589 covering a mechanically stable, thermally reversible lubricating grease composition containing a major amount of hydrocarbon oil and 5-25% of a soap derived from a mixture of from 90-10% of a hydrogenated fish oil fatty acid, said acids having at least 10 carbon atoms in the molecule (Reissue 23, 243).

HALOCARBON GREASES—Halocarbon Products Corp. of North Bergen, N. J. has begun quantity production of stable polymers of chlortrifluorethylene in the form of lubricating oils, greases and waxes. These Halocarbons are said to contain only carbon, fluorine and chlorine and are claimed to be completely inert to all corrosive agents including acids, alkalies, salts and wet or dry oxidizing agents. They also withstand prolonged heating in air at 480 F (Oil, Pt. & Drug Rep 6/26/50 p. 4).

PATENTS AND APPLICATIONS

U.S. 2,510,972 (Gray Co., Inc.)—Lubricating grease dispenser.

Brit. Appl. 29,876/49 (Calif. Res. Corp.)—High melting-high water resistant grease.

We'll See You When You Get There!

N.L.G.I. 18th ANNUAL MEETING

OCTOBER 30, 31, and NOVEMBER 1

Edgewater Beach Hotel -:- Chicago, Illinois

GREASONALITIES

HENRY RUDY WILL REPRESENT NATIONAL STEEL CONTAINER CORPORATION

The National Steel Container Corporation is the National Lubricating Grease Institute's new associate member.

Mr. Henry Rudy, their vice-president in charge of manufacturing, will be their representative and new member of the Institute's Technical Committee. Mr. Rudy has been with the company since it was founded in 1932.

The National Steel Container Corporation, Chicago, manufactures steel shipping containers for paint, grease, oil, chemical, and food industries, also standard and special containers from fourteen gallons up to sixty-five gallons. They also operate one of the most modern drum plants in the industry.

The Corporation moved to the Clearing Industrial District of Chicago in 1940. During the war they supplied steel containers to the armed forces.

BILL MURRAY, CHAIRMAN OF THE API LUBRICATION COMMITTEE

William M. Murray, chairman of the American Petroleum Institute's Lubrication Committee, Division of Marketing, has long had an interest in lubricants and lubrication. Mr. Murray, who has been with Deep Rock Oil Corporation for the past 20 years, has risen through various positions emphasizing lube oil sales to his present post as general manager, Lubricating Oil Sales Department Deep Rock Oil Corporation.

A member of the API's Lubrication Committee since its inception, Mr. Murray has served as secretary and as chairman of the committee's crankcase oil panel. A member of the National Lubricating Grease Institute, he is also a member of the 25-Year Club of the Petroleum Industry and the Society of Automotive Engineers.

He began in the industry by defraying expenses at Chicago's Art Institute with commissions earned for mail-order sales of Deep Rock gas-machine gasoline, original product to bear the company brand. His early work was with Consumer Refining company, first user of the Deep Rock trade name.

Mr. Murray lives in Beverly Hills, suburb of Chicago, with his wife and two daughters. He is a member of the Union League Club of Chicago, Midlothian Country Club and other civic and social organizations.

HODGSON, FENKER, TO REPRESENT PENNSYLVANIA REFINING COMPANY

The Pennsylvania Refining Company, Ohio Division, is the National Lubricating Grease Institute's new active member.

Mr. Donald E. Hodgson will be his company's representative to the Institute.

Mr. Grafton Fenker, chief chemist for Pennsylvania Refining, Ohio Division, will be their representative to the Institute's Technical Committee.

The Pennsylania Refining Company, manufacturers of Penn Drake Petroleum Products, has its refinery at Karns City, Pennsylvania.

Its home office, Ohio Division, is located at 2686 Lisbon Road, Cleveland, Ohio.

CARL E. QUINN APPOINTED FINANCIAL CONSULTANT

In further development of plans to aid independent jobbers in accounting and related fields, Deep Rock Oil Corporation announced the appointment of Carl E. Quinn as Financial Consultant. This new position was created as a result of policies formulated in 1949 for the conversion from company-operated marketing activities to independent jobbing operations.

Many Deep Rock jobbers previously were commission or salary agents, operating properties for which the company kept and supervised accounts. Now as independents, the jobbers are responsible for their own records, including financial and operating statements in addition to complex tax returns.

A native of Illinois, Mr. Quinn has a degree in Commerce from Notre Dame. His experience in oil started in 1940 and includes all phases of field accounting and plant operations. Mr. Quinn is scheduled to visit all Deep Rock jobbers in his work of helping them simplify their systems and accounting work in line with modern business practices.

11 NEW MEMBERS FOR NOPCO 15-YEAR CLUB

In a ceremony at the Harrison, N. J. home office and plant, 11 new members, representing the "Class of '50," have joined the NOPCO 15-YEAR CLUB, it was announced by Charles P. Gulick, Chairman of the Board, Nopco Chemical Company.

The "induction," an annual ceremony attended by all employees who have been with the firm 15 years or longer, marked the 11th anniversary of the group, which now boasts 155 members ranging from 15 to 43 years service, or 22% of all personnel.

Mr. Gulick, in welcoming the newcomers, expressed his gratitude for their loyalty, and awarded each with a gold service pin, plus an extra (or third) week's vacation each year, beginning this summer. The group comprises James Hunt, Frank Todd, Charles Bishop, Arthur Woodward, John Herrold, Ruth Knapp, Frank Chadwick, Joseph Connell, Peter Kramer, Michael Tango and John Forman.

Highlight of the meeting was the presentation of gold watches, emblematic of 25 years service, to Michael Mischak and Charles Hargrove, and a jet crystal desk set to Dr. Chas. I. Post, Asst. V.P., for the same anniversary.

Mr. Gulick, founder of the business, tops the list of Club members, having reached the 43rd milestone. G. Daniel Davis, V.P., ranks second among the officers in point of service (34 years), followed by Albert A. Vetter, Secretary (31 years), Ralph Wechsler, Treasurer (29), Thomas A. Printon, President (28), Perc S. Brown, V.P. and George H. Faux, Asst. Secretary, with 23 years each.

NEW ASSOCIATE MEMBER

The Ohio Corrugating Company is the newest associate member of the NATIONAL LUBRICATING GREASE INSTITUTE.

Mr. L. F. McKay, vice-president of the Ohio Corrugating Company, will release the names of the men appointed to represent their company to the Institute and to the Institute's Technical Committee in the near future.

The Ohio Corrugating Company, manufacturers of steel shipping containers, is a firm of many years' standing. Its home office is at 917 Roanoke, South East, Warren, Ohio.

N. L. G. I. PRESIDENT, EXECUTIVE SECRETARY, WIDELY QUOTED

. . . The President's Page of the March, 1950, issue of THE INSTITUTE SPOKESMAN seems to be receiving considerable attention from the entire petroleum industry. Written by President A. J. Daniel it frankly discussed the often-heard phrase in the petroleum industry, "Is Lubricating Grease A Step-Child?"

First to republish the article in its entirety was Chek-Chart in their SERVICE-BULLETIN. The editor didn't feel comment was necessary because, "We feel that the article speaks for itself". Apparently it spoke volumes. The June 7, 1950 issue of THE GASOLINE RETAILER contained the entire article and the WESTERN AUTOMOTIVE SERVICE also reproduced it in its entirety. Commenting editorially, WESTERN AUTOMOTIVE SERVICE observed: "True, lubrication has not been entirely neglected and has come a long way since the days of two elevated planks and a hand-operated grease gun. But there seems to be a need for revitalizing timely and efficient automotive lubrication with GREASE. Nobody in the industry is in better position to do this than the service operator himself."

While NLGI President Daniel has been telling our industry about lubricating greases, the Executive Secretary has been rather widely quoted on the subject of Trade Associations and their place in the present-day American Economy. THE GASOLINE RETAILER in their issue of June 7, 1950 devoted a complete page to the Secretary's remarks on the subject. THE GASOLINE NEWS for May 5, 1950 summarized the entire article and another summary also appeared in the OIL AND GAS JOURNAL.

Last year the NLGI Secretary lectured at Northwestern University in a course given to Trade Association Secretaries. Word has just been received that he has again been invited to lecture before the same group in August. Announcement of his appearance in this course will be sent to Trade Associations and Chambers of Commerce all over the United States and the name of the N.L.G.I. carried with this announcement.

Recognition by many diverse segments of the business world is an encouraging and healthy sign that our industry is widely acclaimed and heartily admired.

CHARLES B. KARNES NEW N.L.G.I. TREASURER, E. V. MONCRIEFF RESIGNS

. . . Since 1933 E. V. Moncrieff has been the Treasurer of the National Lubricating Grease Institute. Faithfully devoting his services to the new organization, he has been one of the prime factors in building the N.L.G.I. from a small unknown organization to its present size and stability. For sixteen years he has given freely of his time and services to create an organization that would be a credit to every member and to the industry.

ERNEST V. MONCRIEFF

For the past year Mr. Moncrieff has asked the N.L.G.I. Board to relieve him of his responsibilities as Treasurer. Recalling his unselfish and consistent contributions to this industry the Board steadfastly refused to accept his resignation, hoping that he would reconsider. Finally, Treasurer Moncrieff was successful in convincing them that a successor could be found. With the greatest reluctance the Board of Directors accepted his resignation, but insisted that he remain on the Board of Directors, which he consented to do. Organization, experience and leadership which was so thoroughly evident in the past will still be an integral part of our Board of Directors and for that we can all be grateful.

Unanimously elected to succeed Mr. Moncrieff was C. B. Karns (Esso Standard Oil Company). Widely known throughout the petroleum industry "Charlie" Karns has consistently been both a leader and strong booster for the N. L. G. I. throughout his many years of membership. Our organization is to be congratulated upon its success in convincing Mr. Karns that he should assume the rather extensive and sometimes tedious burden of handling our finances. At best, the job of being Treasurer requires considerable time in handling the multitude of rather heavy duties imposed upon him. We are fortunate to have persuaded Mr. Karns that he is the man to offer this service to our industry.

CHARLES B. KARNS

"This reminds me - - my wife said if I don't take her to the N. L. G. I. meeting in Chicago, she'd boil me in oil!"

1950 - FUTURE MEETINGS OF YOUR INDUSTRY

AUGUST

1-4 National Congress of Petroleum Retailers (national convention), Washington Hotel, Seattle, Wash.

3-5 Interstate Oil Compact Commission, (summer meeting), French Lick Springs Hotel, French Lick, Ind.

14-16 Socy. of Automotive Engineers (west coast meeting) Biltmore Hotel, Los Angeles, Calif.

15-18 Delaware Firemen's Short Course, University of Delaware, Newark, Delaware

22 Oil Trades Assn. of New York, Pelham Country Club, Pelham, N. Y.

SEPTEMBER

3-8 American Chemical Society Chicago, Ill.

5-9 Sixth National Chemical Exposition, Coliseum, Chicago, Ill.

8-9 Michigan Petroleum Assn., (fall convention), Grand Hotel, Mackinac Island, Michigan.

SEPTEMBER (cont.)

10-13 American Inst. of Chemical Engineers (regional meeting), Radisson Hotel, Minneapolis, Minn.

11-13 Oil Industry Information committee, Traymore Hotel, Atlantic City, N. J.

11-15 American Socy. of Mechanical Engineers and Instrument Socy. of America (Industrial instruments and regulators conference), Municipal Auditorium, Buffalo, N. Y.

12-14 Socy. of Automotive Engineers, (tractor meeting), Hotel Schroeder Milwaukee, Wis.

13-15 National Assn. of Motor Bus Operators (21st annual meeting), Drake Hotel, Chicago, Ill.

13-15 National Petroleum Assn., Hotel Traymore, Atlantic City, N. J.

14 American Petroleum Institute, (Lubrication Committee), Hotel Traymore, Atlantic City, N. J.

18-22 Fifth National Instrument Conference and Exhibit, Memorial Auditorium, Buffalo, N. Y.

WE'LL SEE YOU
OCTOBER 30, 31, and

SEPTEMBER (cont.)

19-23 American Socy. of Mechanical Engineers Hotel Sheraton, Worchester, Mass.

20-21 Ohio Petroleum Marketers Assn., (fall conference), Netherland Plaza Hotel, Cincinnati, Ohio

25-27 American Socy. of Mechanical Engineers (Petroleum Mechanical Engineering division) The Roosevelt, New Orleans, La.

25-27 American Trade Assn. Executives Somerset Hotel, Boston, Mass.

26-29 Iron and Steel Exposition and annual Convention of Iron and Steel Engineers, Cleveland Public Auditorium, Cleveland, Ohio

27-29 National Metal Trades Assn. Hotel Commodore, New York, N. Y.

27-30 Socy. of Automotive Engineers (aeronautic meeting and aircraft engineering display) Biltmore Hotel, Los Angeles, Calif.

OCTOBER

1-3 Independent Petroleum Assn. of America (annual meeting) Jefferson Hotel, St. Louis, Mo.

3-5 American Inst. of Electrical Engineers (district No. 2), Lord Baltimore Hotel, Baltimore, Md.

11 American Iron and Steel Inst. (regional technical meeting), Hotel William Penn., Pittsburg, Pa.

12-13 Indiana Independent Petroleum Assn. (fall convention) Hotel Severin, Indianapolis, Ind.

16-18 Socy. of Automotive Engineers (transportation meeting) Hotel Statler, New York, N. Y.

16-20 National Safety Congress Chicago, Ill.

16-21 Oil Progress Week

19-22 Permian Basin Oil Show, Odessa, Texas

20-21 American Management Assn., Hotel Statler, New York, N. Y.

AT THE N.L.G.I. 18th ANNUAL MEETING

NOVEMBER 1 - EDGEWATER BEACH HOTEL - CHICAGO, ILLINOIS

BE SURE YOU HAVE YOUR RESERVATION!

OCTOBER (cont.)

23-27 American Inst. of Electrical Engineers (fall general meeting), Skirvin Hotel, Oklahoma City, Okla.

23-27 National Metal Exposition Amphitheatre, Chicago, Ill.

24-25 South Dakota Independent Oil Men's Assn. Aberdeen Civic Arena, Aberdeen, S. D.

25 American Iron and Steel Inst. (regional technical meeting), Hotel Thomas Jefferson, Birmingham, Ala.

30 to Nov. 1 NATIONAL LUBRICATING GREASE INSTITUTE (annual meeting) Edgewater Beach Hotel, Chicago, Ill.

31 Oil Trades Assn. of New York, Waldorf-Astoria Hotel, New York, N. Y.

NOVEMBER

2-3 Socy. of Automotive Engineers (diesel engine meeting) Hotel Knickerbocker, Chicago, Ill.

3-4 Socy. of Rheology (annual meeting) Hotel New Yorker, New York, N. Y.

9-10 Socy. of Automotive Engineers (fuels and lubricants meeting) Mayo Hotel, Tulsa, Okla.

10 American Iron and Steel Inst. (regional technical meeting), Hotel Mark Hopkins, San Francisco, Calif.

11-13 OIL INDUSTRY INFORMATION COMMITTEE Biltmore Hotel, Los Angeles, Calif.

13-14 AMERICAN PETROLEUM INSTITUTE (Lubrication Committee), Biltmore Hotel, Los Angeles, Calif.

13-16 AMERICAN PETROLEUM INSTITUTE (30th annual meeting) Biltmore Hotel and the Ambassador, Los Angeles, Calif.

NOVEMBER (cont.)

13-17 Nat'l. Electrical Manufacturers Assn., Chalfonte-Haddon Hall, Atlantic City, N. J.

26 to Dec. 1 American Socy. of Mechanical Engineers Hotel Statler, New York, N. Y.

27-29 American Standards Assn. Waldorf-Astoria Hotel, New York, N. Y.

27 to Dec. 2 19th Exposition of Power and Mechanical Engineering Grand Central Palace, New York, N. Y.

DECEMBER

3-6 American Inst. of Chemical Engineers (annual meeting), Neal House, Columbus, Ohio

4-5 Oil Industry TBA Group (1950 meeting), Edgewater Beach Hotel, Chicago, Ill.

26-31 American Assn. for the Advancement of Science (annual meeting) Hotel Statler, Cleveland, Ohio

1951—Future Meetings Of Your Industry

JANUARY, 1951

8-9 Kansas Oil Men's Assn. (Annual Convention), Lassen Hotel, Wichita

8-12 Socy. of Automotive Engineers (annual meeting and Engineering display) Hotel Book-Cadillac, Detroit, Mich.

22-26 American Inst. of Electrical Engineers (winter general meeting), Hotel Statler, New York, N. Y.

25-26 Northwest Petroleum Assn. (annual convention), Nicollet Hotel, Minneapolis, Minn.

FEBRUARY, 1951

20-21 Kentucky Petroleum Marketers Assn. (annual meeting, convention, and trade show), Brown Hotel, Louisville, Ky.

27-28 Wisconsin Petroleum Assn. (annual convention and equipment show), Milwaukee Auditorium, Milwaukee, Wisc.

"Joe, every time I look at this kettle I get all stirred up - - about the N. L. G. I. Annual Meeting - - they say it's going to be a hot session this year!"

THE N.L.G.I. GUIDE POST

Industry CROSSROADS FOR BUYERS and SELLERS

SUPPLIERS OF MATERIALS FOR MANFACTURING LUBRICATING GREASES

MANUFACTURERS OF EQUIPMENT FOR APPLICATION OF LUBRICATING GREASES

NEW WITCO BOOK, CARBON BLACK

Witco Chemical Company, who have nearly thirty years of experience in the manufacture of carbon blacks, announce a new bulletin entitled "Witco blacks in natural and chemical rubbers." The 63-page booklet, profusely illustrated with valuable charts and statistical data, gives simplified and dependable information of particular interest to the rubber industry as well as to other industrial users of carbon black.

Write to Witco Chemical Company, 295 Madison Avenue, New York 17, New York, for a copy of the bulletin.

PRECISION SCIENTIFIC OFFERS NEW BULLETIN

The new 20-unit Precision-Warburg Manometricon for micro gas reactions and the Precision-Dubnoff Metabolic Shaking Incubator for metabolic studies are described in a 10 page illustrated bulletin recently printed by Precision Scientific Company. A presentation of a Refrigerated Warburg Manometricon and the 10-unit Manometricon for small laboratory use is included. The bulletin not only gives a comprehensive discussion of outstanding features and applications of these instruments but also lists valuable reference material.

Copies of Bulletin No. 675 will be mailed on request.

"24 HOURS OF PROGRESS"

A new 16 millimeter sound motion picture is being produced by the Oil Industry Information Committee as another step in its campaign to help the public become better acquainted with the complex but fascinating oil industry.

Louis de Rochemont Associates, Inc., will produce the 30-minute black-and-white motion picture. Film Counselors, Inc., of New York, will supervise it.

de Rochemont is noted as a producer of documentary films, with special emphasis on the use of real locations. He founded the "March of Time" series years ago, and won an Academy Award for "Fighting Lady," which he produced in Hollywood.

Working title for the new motion picture is "24 Hours of Progress." It will have original footage throughout, and will have an original movie score.

The motion picture will give a 'round-the-clock story of 24 hours in the United States, and the role that petroleum and petroleum products plays in the lives and habits of the nation's 150 million residents.

It is expected to be completed late this summer, so that it will be ready for public showing prior to Oil Progress Week next October.

The new motion picture will complement the 1949 production, "The Last Ten Feet," which has been received enthusiastically by thousands of persons in the United States. This motion picture is still in great demand, and is being shown constantly to many audiences in all parts of the country.

Philip C. Humphrey, manager of the Public Relations department, The Texas Company, New York, is chairman of the OIIC motion picture sub-committee which is charged with preparation and production of the new motion picture.

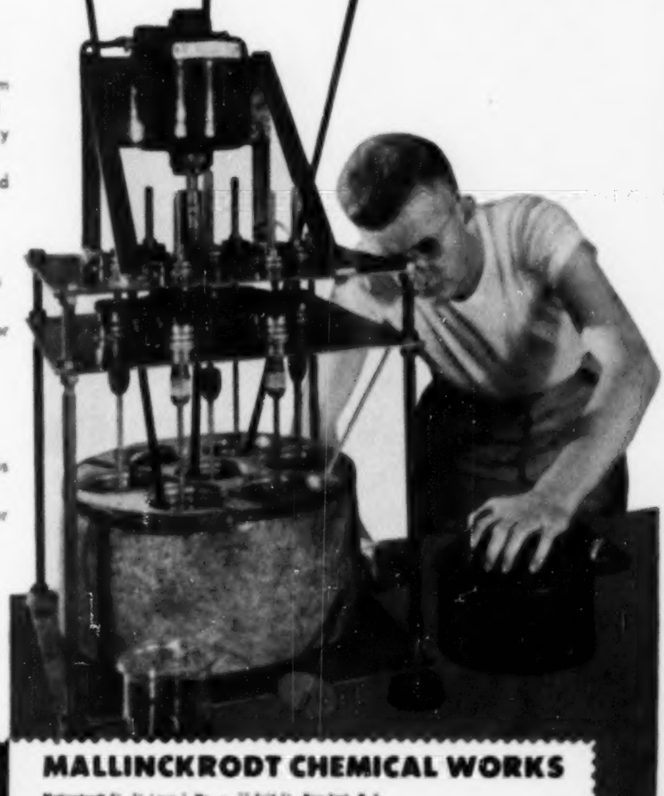
REMEMBER!

TIME: OCT. 30, 31, & NOV. 1

PLACE: EDGEWATER BEACH HOTEL

CHICAGO, ILLINOIS

OCCASION: N.L.G.I. Annual Meeting!




WITCO
technical service
helps tailor the product to the problem
WITCO offers not only a series of proved high gelling type stearates, but also technical service to assist in the selection of a grade tailored to your specific requirements.
This service may enable you to reduce soap content of grease substantially, and improve finished grease quality.
You can rely on WITCO stearates for absolute uniformity . . . increased mechanical stability of greases during manufacture and use . . . increased stability in storage . . . less susceptibility to cooling rate . . . complete incorporation of soap (special grades) in oil at lower temperatures than usually employed.
It will pay you to utilize Witco's laboratory, pilot and grease plant experience in the solution of your problems.
YOU KNOW THAT WITCO MAKES HIGHEST QUALITY PRODUCTS
WITCO stearates for the grease industry:
ALUMINUM STEARATE #22
ALUMINUM STEARATE #22-C
ALUMINUM STEARATE #23
ALUMINUM STEARATE #22-G
LITHIUM STEARATE
WITCO
Chemical Company
295 Madison Ave., N. Y. 17, N. Y.
WITCO
Los Angeles • Boston • Chicago • Detroit
Cleveland • San Francisco • Akron
London and Manchester, England

When Your LINE Falls BEHIND...

You're "hooked in the end" when your lubricating grease line falls behind in today's highly competitive market. To catch bigger fish or build bigger lubricating grease volume, it takes experience to keep your line out front.

Why tackle the market with less than the best when your brand name and reputation can be protected by Battenfeld's 31 years experience in private label lubricating grease manufacture?

Cast your eyes on the Battenfeld line... the line that is backed by experience and research. You will net more profits as well as build greater sales volume.

Drop us a line today. We'll come up with full details.

"BUSINESS IS INCREASING"

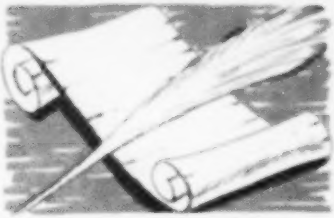
battenfeld

GREASE & OIL CORPORATION

KANSAS CITY, MO.

MINNEAPOLIS, MINN. N. TONAWANDA, N. Y.

Associate and Technical Members . . . of the National Lubricating Grease Institute



Supporting Your Organization These Suppliers of Your Industry Hold Membership in the N. L. G. I.

SUPPLIERS OF MATERIALS FOR MANUFACTURING LUBRICATING GREASES

Armour & Co., Chemical Division
1355 West 31st St.
Chicago 9, Illinois
Member—Dale V. Stingley

American Cyanamid Company
30 Rockefeller Plaza
New York City, New York
Member—A. Scharwachter

Darling & Company
4201 South Ashland Avenue
Chicago 9, Illinois
Member—George W. Trainor

Emery Industries, Inc.
Carew Tower
Cincinnati 2, Ohio
Member—R. F. Brown

Foote Mineral Company
18 W. Chelten Street
Philadelphia 44, Pennsylvania
Member—H. C. Meyer, Jr.

A. Gross & Company
295 Madison Avenue
New York City 17, New York
Member—Eugene Adams

W. C. Hardesty Co., Inc.
41 East 42nd Street
New York City, New York
Member W. G. McLeod

Harshaw Chemical Company
1945 East 97th Street
Cleveland 6, Ohio
Member—G. G. Unkefer

Lubrizol Corporation
Euclid Station
Cleveland 17, Ohio
Member—J. H. Baird

Mallinckrodt Chemical Works
New York 8, New York
St. Louis 7, Missouri
Member—C. E. Cosby

N. I. Malmstrom & Company
147 Lombardy Street
Brooklyn 22, New York
Member—Ivar Wm. Malmstrom

Metasap Chemical Corporation
Harrison, New Jersey
Member—O. E. Lohrke

Monsanto Chemical Company
1700 Second Street
St. Louis 4, Missouri
Member—J. W. Newcombe

National Lead Company
105 York Street
Brooklyn 1, New York
Member—Alexander Stewart

National Rosin Oil Products, Inc.
R.K.O. Bldg., Rockefeller Center
New York City, New York
Member—Richard Bender

M. W. Parsons, Imports & Plymouth Organic Labs., Inc.
59 Beekman Street
New York City 7, New York
Member—H. Bye

Swift & Company, Industrial Oil Division
165th & Indianapolis Blvd.
Hammond, Ind.
Member—F. H. Beneker

Warwick Chemical Company
Division of the Sun Chemical Corporation
10-10 44th Avenue
Long Island City 1, New York
Member—Dr. J. J. Whitfield

The Werner G. Smith Co.
(Division of Archer-Daniels-Midland Co.)
2191 West 110th Street
Cleveland 2, Ohio
Member—F. C. Haas

Witco Chemical Co.
75 E. Wacker Drive
Chicago, Illinois
Member—B. W. Lewis

CONTAINER MANUFACTURERS

Central Can Company, Inc.
2415 West 19th Street
Chicago, Illinois
Member—Henry Frazin

Continental Can Co.
1103 Waldheim Building
Kansas City 6, Missouri
Member—N. M. Potts

Geuder, Paeschke & Frey Co.
324 North Fifteenth Street
Milwaukee 3, Wisconsin
Member—Willard J. Flint

Inland Steel Container Company
6532 South Menard Avenue
Chicago 38, Illinois
Member—G. D. Zurk

J & L Steel Barrel Company
405 Lexington Ave.
New York 17, New York
Member—Jerry Lyons

National Steel Container Corporation
6700 South LeClaire Avenue
Chicago 38, Illinois

Ohio Corrugating Co.
917 Roanoke Ave. Sa. E.
Warren, Ohio

Rheem Manufacturing Company
570 Lexington Avenue
New York, New York
Member—G. Wesley Gates

United States Steel Products Co.
30 Rockefeller Plaza
New York City 20, New York
Member—Wm. I. Hanrahan

Vulcan Stamping & Manufacturing Co.
300 Madison Street
Bellwood, Illinois
Member—Dale M. Harpold

MANUFACTURERS OF EQUIPMENT FOR APPLICATION OF LUBRICATING GREASES

The Aro Equipment Corporation
Byron, Ohio
Member—R. W. Morrison

Balcrank, Inc.
Disney near Marburg
Cincinnati 9, Ohio
Member—R. P. Field

Gray Company, Inc.
60 11th Avenue Northeast
Minneapolis 13, Minnesota
Member—L. L. Gray

Lincoln Engineering Company
5730 Natural Bridge Avenue
St. Louis, Missouri
Member—Foster Holmes

National Sales, Inc.
812 North Main Street
Wichita, Kansas

Stewart-Warner Corp.
1826-1852 Diversey Parkway
Chicago, Illinois
Member—Walter Duncan

U. S. Air Compressor Company
5300 Harvard
Cleveland, Ohio
Member—C. A. Bening

LABORATORY EQUIPMENT AND SUPPLIES

Precision Scientific Company
3737 Cortland Street
Chicago 47, Illinois
Member—Alexander I. Newman

SUPPLIERS OF EQUIPMENT FOR MANUFACTURING LUBRICATING GREASES

Buflovak Equipment Division of Blaw-Knox Company
1543 Fillmore Avenue
Buffalo 15, New York
Member—A. W. Johnson

The Girdler Corp.
Louisville 1, Kentucky
Member—John E. Slaughter, Jr.

Stratford Engineering Corporation
1414 Dierks Building
Kansas City, Missouri
Member—J. A. Altshuler

REFINERS

Calumet Refining Company
4323 Southwestern Blvd.
Chicago, Illinois
Member—H. E. Somerou

Farmers Union Central Exchange, Inc.
P. O. Box G
St. Paul 1, Minnesota
Member—H. F. Wagner

Mid-Continent Petroleum Corporation
Tulsa, Oklahoma
Member—T. E. Fitzgerald

TECHNICAL AND RESEARCH ORGANIZATIONS

Cargill, Incorporated
200 Grain Exchange
Minneapolis 15, Minnesota
Member—Dr. Sabine Hirsch

Mellon Institute of Industrial Research
University of Pittsburgh
Pittsburgh 13, Pennsylvania
Member—Malcolm Finlayson

Midwest Research Institute
4049 Pennsylvania
Kansas City 2, Missouri